

NON-PUBLIC?: N
ACCESSION #: 9402030190
LICENSEE EVENT REPORT (LER)

FACILITY NAME: COMANCHE PEAK-UNIT 1 PAGE: 1 OF 5

DOCKET NUMBER: 05000445

TITLE: REACTOR TRIP CAUSED BY PERSONNEL ERROR DURING MAIN
TURBINE EHC SYSTEM TROUBLE SHOOTING
EVENT DATE: 12/24/93 LER #: 93-011-00 REPORT DATE: 01/24/94

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: M. L. LUCAS, I&C MANAGER TELEPHONE: (817) 897-6731

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 11:46 a.m. on December 24, 1993, during trouble shooting on the main Turbine Electro-hydraulic Control System (EHC) Unit 1 received a main turbine low lube oil pressure signal resulting in a turbine electrical trip which in turn caused a reactor trip. Turning gear valve 1-HV-6554A received an open signal due to an erroneous signal (less than 230 RPM) coming from the turbine speed control circuitry.

Contributing factors were lack of specific training on the complexity of the EHC system and use of non-grounded test equipment. Corrective actions included event review, lessons learned and training content review.

END OF ABSTRACT

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I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)(EHS:(JC)).

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On December 24, 1993, Comanche Peak Steam Electric Station (CPSES) Unit 1 was in Mode 1, Power Operation, with reactor power at 100 percent.

C. STATUS OF STRUCTURES, SYSTEMS, OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

There were no inoperable structures, systems or components that contributed to the event.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

At 5:30 a.m. on December 24, 1993, the night shift Shift Supervisor (utility, licensed) turned over an item to the day shift Shift Supervisor (utility, licensed) on an EHC (electro-hydraulic control) (EHS:(TG)) failure alarm that was thought to be in due to a turbine-generator speed Channel 2 problem. The night shift Shift Supervisor had determined from the night shift I&C supervisor (utility, non-licensed) that there were no qualified I&C personnel available to troubleshoot the problem on the night shift, therefore the work was assigned to the day shift. After shift turnover, the Unit 1 Unit Supervisor (utility, licensed) contacted the responsible day shift I&C supervisor (utility, non-licensed) for assistance and was told that personnel would be available to troubleshoot the problem. It was also established that troubleshooting would only be performed on Channel 2 equipment. As such, the troubleshooting was not classified as a high risk activity.

The troubleshooting consisted of looking at the signals going through Channel 2 of the Pulse Converter Card. Since a single

signal from the Hall sensing probe supplied the input to the card and only one of the two output signals appeared to be missing, it appeared the card was not generating the second signal and was deemed defective. A replacement card was obtained. A call was made to one of I&C's experienced turbine

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technicians to ensure that no problems would be encountered in replacing the card at power. The experienced I&C technician confirmed that there is a possibility that an alarm for the Speed Target Unit (STU) would come in when the card was removed. The Balance-of-Plant (BOP) operator (utility, licensed) was informed of this and the card was replaced. The card replacement had no effect on the indications and the I&C Technician (utility, non-licensed) decided to look at the signals on Channel 1 for comparison. The technician chose to look at Channel 1 (without approval of the Control Room staff) in the STU, because the STU appeared to have both channels working. Using a grounded AC powered oscilloscope, the test leads were connected to Channel 1 input of the Hall probe for comparison. Shortly thereafter, the technicians noticed the turbine had tripped. They disconnected the test equipment, closed up the cabinet they were working in, and went to the Control Room to evaluate the conditions and appraise the Shift personnel.

Following the trip at approximately 11:46 a.m., Control Room personnel responded in accordance with emergency operating procedures. Plant systems responded as expected. The plant was stabilized in Mode 3, Hot Standby. An event or condition that results in an automatic actuation of any ESF, including the RPS, is reportable within 4 hours under 10CFR50.72(b)(2)(ii). At 2:02 p.m. on December 24, 1993, the Nuclear Regulatory Commission Operations Center was notified of the event via Emergency Notification System..

E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE, OR PROCEDURAL OR PERSONNEL ERROR

The reactor trip was annunciated by numerous alarms in the Control Room.

II. COMPONENT OR SYSTEM FAILURES

A. FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT

Hall Probe Sensor had no output.

B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

The internal clamps became loose and shorted out the Hall Probe Sensor.

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C. SYSTEMS OR SECONDARY FUNCTIONS THAT WERE AFFECTED BY FAILURE OF COMPONENTS WITH MULTIPLE FUNCTIONS

Not applicable - No failures of components with multiple functions have been identified.

D. FAILED COMPONENT INFORMATION

Hall Probe Sensor
Manufacturer: Seimens
Part Number: 54-103-542-003

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

During the trouble shooting, when the I&C technician connected the grounded AC powered oscilloscope to Channel 1 input of the Hall probe, a spurious signal occurred due to a floating ground in the I&C cabinets. This spurious signal caused a low spike in the speed signal and a low lube oil pressure signal causing a main turbine electrical trip and a reactor trip. Auxiliary Feedwater system was manually actuated after the reactor trip.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

No safety system trains were inoperable during this transient.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

This event is analyzed in Section 15.2.3 of the CPSES Final Safety Analysis Report (FSAR). The analysis uses conservative assumptions to demonstrate the Departure from Nucleate Boiling

Ratio will not decrease below the limiting value of 1.30 during the event. The protective functions responded as required. The event is bounded by the FSAR accident analysis. The event of December 24, 1993, did not adversely affect the safe operation of CPSES Unit I or the health and safety of the public.

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IV. CAUSE OF THE EVENT

The causes which contributed to this event were:

- The I&C technicians believed that the task was a low risk task.
- The I&C technicians were not sufficiently familiar with the EHC circuitry and/or lacked experience.
- The I&C technicians performed work on the Channel 1 without the approval of Control Room staff.

V. CORRECTIVE ACTIONS TO PREVENT RECURRENCE

The I&C technicians have reviewed this event and surrounding issues. Formal training is being revised to include aspects from this event and to include more detailed objectives and lessons regarding understanding of the EHC circuitry.

VI. PREVIOUS SIMILAR EVENTS

There have been other CPSES Licensee Event Reports (LER) which describe events involving personnel errors. The details of previously reported events are sufficiently different from the event described in this LER such that previous corrective actions could not have prevented this event.

VII. ADDITIONAL INFORMATION

The times listed in the report are approximate and Central Standard Time.

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Log # TXX-94010
TUELECTRIC File # 10200
Ref. # 50.73
50.73(a)(2)(iv)

William J. Cahill, Jr.
Group Vice President

January 24, 1994

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES) UNIT 1
DOCKET NO. 50-445
MANUAL OR AUTOMATIC ACTUATION OF ANY
REACTOR PROTECTION SYSTEM
LICENSEE EVENT REPORT 93-011-00

Gentlemen:

Enclosed is Licensee Event Report 93-011-00 for Comanche Peak Steam
Electric Station Unit 1, "Reactor Trip Caused by Personnel Error during
Main Turbine EHC System Trouble Shooting."

Sincerely,

William J. Cahill, Jr.

By:
Roger D. Walker
Manager of Regulator Affairs

ADQ:bm

cc: Mr. L. J. Callan, Region IV
Mr. L. A. Yandell, Region IV
Resident Inspectors, CPSES

400 N. Olive Street L.B.81 Dallas, Texas 75201

*** END OF DOCUMENT ***
